

## Remarks

Please cancel claims 7-11. Claims 1 and 4-6 remain pending in the present application.

In the Office Action of February 20, 2007, the Patent Office noted that the application contained claims 7-11 drawn to an invention nonelected with traverse. Claims 7-11 have been cancelled.

In the Office Action of February 20, 2007, claims 1 and 4-6 were rejected under 35 U.S.C. §102(b) as anticipated by, or in the alternative, as obvious over U.S. Patent No. 4,617,490 to Fitzpatrick et al. Applicants respectfully traverse the rejection.

Claim 1 is directed to a fuel cell engine coolant comprised of an aqueous 1,3-propanediol, which, among other characteristics, has an electrical resistivity of greater than 250 Kohm-cm.

Fitzpatrick discloses a cathode ray tube device with an improved color filtering system comprising cinnamaldehyde or cinnamic alcohol and a solvent comprised of a combination of water and an aliphatic alcohol. The aliphatic alcohol may be 1,3-propanediol. The solvent may be from 20 wt.% to 80 wt.% of the aliphatic alcohol. The improved color filtering system also includes several salts such as a soluble praseodymium salt, a soluble holmium salt, a soluble erbium salt, or a soluble neodymium salt. Fitzpatrick is silent regarding the electrical resistivity of the improved color filtering system.

Claim 1 and its dependent claims 4-6 are novel over the disclosure of Fitzpatrick. As acknowledged by the Patent Office, Fitzpatrick is silent as to the electrical resistivity of color filtering system disclosed therein. Fitzpatrick, therefore, does not explicitly disclose the coolant composition as claimed in claim 1 since the claimed composition is required to have an electrical resistivity of greater than 250 Kohm-cm.

The Patent Office alleges, however, that the fuel cell engine coolant composition as claimed in claim 1 is inherently disclosed by Fitzpatrick. The color filtering system/solution disclosed by Fitzpatrick, however, does not necessarily have an electrical resistivity of greater than 250 Kohm-cm—in fact it very likely does not—Fitzpatrick does not inherently disclose the fuel cell engine coolant composition as claimed in claim 1. The fact that a certain result or characteristic may occur or be present in the prior art is

not sufficient to establish the inherency of that result or characteristic. *In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993).

The Patent Office has not established sufficient factual evidence or sufficient technical reasoning to reasonably support a determination that the allegedly inherent electrical resistivity characteristic claimed in the composition of claim 1 necessarily flows from the teaching of Fitzpatrick. "In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art." *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990). The Patent Office states that the color filtering system/solution taught by Fitzpatrick explicitly discloses aqueous 1,3-propanediol as a species useful as a coolant in the color filtering system/solution of Fitzpatrick. The Patent Office alleges that this is sufficient disclosure to encompass the composition as claimed in claim 1, apparently on the assumption that all aqueous 1,3-propanediol solutions provide the claimed characteristics, including electrical resistivity, either alone or in combination with any other materials, e.g. soluble salts such as those included in the color filtering system/solution of Fitzpatrick.

First, as shown in the declaration of Mr. Glenn Komplin under 37 CFR §1.132 submitted with the Applicants last response, the electrical resistivity of an aqueous 1,3-propanediol solution is dependent on the concentration of ions in the water and the amount of water in the aqueous 1,3-propanediol solution, and it is clearly shown in the declaration that aqueous 1,3-propanediol solutions may have an electrical resistivity ranging from 4 Kohm-cm to 1250 Kohm-cm, clearly including solutions having an electrical resistivity below 250 Kohm-cm. The declaration is useful to prove that aqueous 1,3-propanediol solutions do not necessarily have an electrical resistivity of greater than 250 Kohm-cm, showing that such an electrical resistivity is not inherent to an aqueous solution of 1,3-propanediol—regardless whether claim 1 and its dependent claims 4-6 include a claim to deionized water or not. Therefore, the Patent Office's technical reasoning—that the mere presence of aqueous 1,3-propanediol in the color filtering system/solution of Fitzpatrick necessarily provides the color filtering system/solution with an electrical resistivity of at least 250 Kohm-cm—is unreasonable

and does not support a determination that the color filtering system/solution of Fitzpatrick containing aqueous 1,3-propanediol inherently has an electrical resistivity of at least 250 Kohm-cm. As such, the Patent Office has failed to meet the burden of proof required to establish that the Fitzpatrick reference anticipates claim 1 and its dependent claims.

Second, the color filtering system/solution of the Fitzpatrick reference includes soluble color filtering salts which decrease the electrical resistivity of the color filtering system/solution. The Patent Office contends that the applicant's specification permits and requires additional components (p. 6-9), such as salts and acids which act as inhibitors, and that the color filtering system/solution of Fitzpatrick includes additional ingredients such as salts as stated by applicant. Applicant's specification, however, states that ionic inhibitors are disqualified in the 1,3-propanediol coolant as a result of the 400 volt electric field in a fuel cell engine and the issues that such a field presents to the coolant (see application text, p. 6 line 30 – p. 7 line 2). The specification discloses that certain tests were run on an aqueous and anhydrous 1,3-propanediol coolant solutions where the solutions contained commercial inhibitor packages for comparative purposes against an ethylene glycol coolant to measure certain characteristics of the aqueous 1,3-propanediol coolant (e.g. corrosivity) in accordance with ASTM test requirements. This does not imply that addition of ionic inhibitors does not affect the electrical resistivity, it merely shows the performance of aqueous and anhydrous 1,3-propanediol relative to ethylene glycol under standard recognized test conditions. Claim 1 requires an electrical resistivity of greater than 250 Kohm-cm, and the specification clearly supports claim 1 by indicating that ionic inhibitors are disqualified in aqueous and anhydrous 1,3-propanediol coolants for use as a coolant in electrical fuel cell engines. It is unreasonable, therefore, for the Patent Office to contend that the Fitzpatrick color filtering system/solution including the additional salt ingredients inherently (necessarily) encompass the claimed electrical resistivity limitation.

In the Office Action of February 20, 2007, claims 1 and 4-6 were also rejected under 35 U.S.C. §103(a) as obvious over Fitzpatrick. Applicants respectfully traverse the rejection on the basis that the Patent Office has failed to establish a *prima facie* case of obviousness.

Claim 1 requires a composition comprised of an aqueous 1,3-propanediol solution having, among other characteristics, an electrical resistivity of greater than 250 Kohm-cm. As noted above, Fitzpatrick teaches a color filtering system/solution that may contain an aqueous 1,3-propanediol solution and that contains soluble color filtering salts. The Patent Office concedes that Fitzpatrick teaches nothing regarding the electrical resistivity of the color filtering system/solution.

In order to establish a *prima facie* case of obviousness there must be some suggestion or motivation to modify a reference, there must be a reasonable expectation of success, and the prior art reference must teach or suggest all the claim limitations. (MPEP 2143 8<sup>th</sup> Ed. 2006). The Patent Office has failed to establish a *prima facie* case of obviousness that the Fitzpatrick reference renders claim 1 and its dependent claims 4-6 obvious since the Patent Office has failed to show that Fitzpatrick either teaches or suggests all the claim limitations of claim 1—specifically Fitzpatrick does not teach or suggest a composition having an electrical resistivity of greater than 250 Kohm-cm. As noted by the Patent Office, Fitzpatrick is silent with respect to the electrical resistivity of compositions taught therein. The Patent Office attempts to establish a *prima facie* case of obviousness on the basis that the claimed electrical resistivity limitation is inherent or implicit in the compositions disclosed by Fitzpatrick, as permitted under MPEP 2112 (III) and 2144.02. In order to do so, the examiner must rely on sound logic and scientific principle provided that, when relying on scientific theory, evidentiary support for the existence and meaning of that theory is provided (*see In re Soli*, 137 USPQ 797 (CCPA 1963); *In re Grose*, 201 USPQ 57 (CCPA 1979); and MPEP 2144.02 8<sup>th</sup> ed. 2006). The support the Patent Office cites for establishing that the claimed electrical resistivity limitation is inherently or implicitly disclosed in Fitzpatrick is that "the compositions of Fitzpatrick et al specifically teach with sufficient specificity the specific 1,3 propanediol (trimethylene glycol) for use as solution that has coolant and antifreeze properties." The Patent Office then concludes that "Therefore, the skilled artisan would have expected similar characteristics of the solutions disclosed in Fitzpatrick et al, in the absence of showing to the contrary."

Applicants, however, have shown that the mere fact that 1,3-propanediol is present in the compositions of Fitzpatrick is not sufficient evidence to support the

scientific theory advanced by the Patent Office that all compositions containing aqueous 1,3-propanediol necessarily have an electrical resistivity of at least 250 Kohm-cm. The declaration of Mr. Glenn Komplin submitted with the last response shows that aqueous 1,3-propanediol solutions may have an electrical resistivity ranging from 4 Kohm-cm to 1250 Kohm-cm. The Patent Office admits as much, stating "the examiner does not dispute the fact that conductivity varies amongst different proportions of PDO [1,3-propanediol] and water (deionized or tap)." As such, the Patent Office has failed to provide evidence that compositions containing aqueous 1,3-propanediol inherently have an electrical resistivity of greater than 250 Kohm-cm, and has failed to establish a *prima facie* case of obviousness as a result of failing to establish that the Fitzpatrick reference teaches or suggests the electrical resistivity limitation of claim 1 and its dependent claims 4-6.

Even if aqueous 1,3-propanediol solutions inherently did have an electrical resistivity of greater than 250 Kohm-cm—which as discussed above, they do not—the soluble salts present in the compositions of Fitzpatrick used as color filterants would decrease the electrical resistivity of the compositions of Fitzpatrick greatly. It is generally known among those skilled in the art that increasing the ionic concentration of an aqueous solution—such as the color filtering system/solution of Fitzpatrick—increases the electrical conductivity of the solution and decreases the electrical resistivity of the solution. For example, liquid electrolyte containing batteries operate at full power when the electrolyte solutions are fresh and have high ionic concentrations but lose power as the ionic concentration of the liquid electrolyte solutions decrease. The Patent Office contends that the applicant's specification permits and requires additional ionic components such as salts and acids which act as inhibitors, and, therefore, the presence of such salts admixed with PDO would inherently encompass the electrical resistivity requirement. As discussed above, however, the Applicant's specification clearly states that ionic inhibitors are disqualified in the 1,3-propanediol coolant as a result of the 400 volt electric field in a fuel cell engine and the issues that such a field presents to the coolant (see application text, p. 6 line 30 – p. 7 line 2). As such, again the Patent Office fails to establish a *prima facie* case of obviousness of the claims over the Fitzpatrick reference since the Patent Office has failed to establish that the Fitzpatrick reference

teaches or suggests the electrical resistivity limitation of claim 1 and its dependent claims 4-6

The Patent Office asserts that the declaration of Mr. Glenn Komplin bears little weight upon patentability of the claimed invention as it is not effective to rebut a *prima facie* case of obviousness since it fails to compare the claimed subject matter with the closest prior art (the compositions of the Fitzpatrick reference), but rather, provides measurements only on the conductance of PDO and deionized water and PDO and tap water. Applicants do not purport to use Mr. Komplin's declaration to rebut a *prima facie* case of obviousness, but to show that the Patent Office has failed to establish a *prima facie* case of obviousness by failing to teach or suggest all the limitations of claim 1 and its dependent claims—in particular by showing that the scientific theory upon which the Patent Office relies to establish that the reference teaches or suggests all the limitations of claim 1 is incorrect.

In the Office Action of February 20, 2007, claims 1 and 6 were rejected under 35 U.S.C. §102(b) as anticipated by, or in the alternative under 35 U.S.C. §103(a) as obvious over, JP (06026979) (the "JP '979" patent). Applicants respectfully traverse the rejection.

Claim 1 is discussed above, and claim 6 is dependent on claim 1.

JP '979 discloses a leak detecting composition comprising an antifreeze agent, water, rust preventing agent, and preservatives. JP '979 specifically teaches that the composition comprises as an anti-freeze agent 1,3-propanediol, quaternary ammonium salt as a preservative, and a nitrate salt as a preventing agent. As the Patent Office notes, JP '979 is silent with respect to electrical resistivity.

The Patent Office asserts that composition claimed in claim 1 and its dependent claim 6 is anticipated by the JP '979 patent since the JP '979 patent specifically teaches compositions "with sufficient specificity the specific 1,3 propanediol (trimethylene glycol) for use as a solution that has coolant and antifreeze properties", and that the claimed electrical resistivity would be inherent to the compositions of JP '979 as a result of use of 1,3-propanediol in the compositions. This is the same argument made with respect to the Fitzpatrick reference—that 1,3-propanediol allegedly inherently has an electrical resistivity of greater than 250 Kohm-cm, therefore the disclosed compositions also inherently have an electrical resistivity of greater than 250 Kohm-cm. This is

incorrect for the reasons discussed above with respect to Fitzpatrick—aqueous solutions of 1,3-propanediol do not inherently have an electrical resistivity of greater than 250 Kohm-cm as shown by the declaration of Mr. Glenn Komplin, therefore the compositions disclosed in the JP '979 patent do not inherently disclose the composition claimed in claim 1 or in claim 6. Further, like Fitzpatrick, the compositions of the JP '979 patent include salts that are soluble in the compositions which significantly decrease electrical resistivity of the compositions such that the compositions of the JP '979 patent do not inherently have an electrical resistivity of greater than 250 Kohm-cm.

Claim 1 and claim 6 are also not obvious over the compositions of the JP '979 patent since the JP '979 patent does not disclose compositions having an electrical resistivity of greater than 250 Kohm-cm either explicitly or implicitly. In order to establish a *prima facie* case of obviousness of claims 1 and 6 over the compositions disclosed in JP '979, the Patent Office again must rely on the assumption that aqueous 1,3-propanediol solutions inherently have an electrical resistivity of greater than 250 Kohm-cm. As shown above with respect to Fitzgerald, such an assumption is flawed. Therefore, no *prima facie* case of obviousness may be established with respect to the JP '979 reference since the Patent Office has failed to show that JP '979 teaches or suggests the electrical resistivity limitation of claim 1 and/or claim 6.

Further, like Fitzpatrick, the compositions of the JP '979 patent include salts that are soluble in the compositions which significantly decrease the electrical resistivity of the compositions. As noted above, the Applicant's specification clearly states that ionic inhibitors are disqualified in the 1,3-propanediol coolant as a result of the 400 volt electric field in a fuel cell engine and the issues that such a field presents to the coolant (see application text, p. 6 line 30 – p. 7 line 2). As such, again the Patent Office fails to establish a *prima facie* case of obviousness of the claims over the JP '979 reference since the Patent Office has failed to establish that the JP '979 reference teaches or suggests all the electrical resistivity limitation of claim 1 and its dependent claims 4-6.

In the Office Action of February 20, 2007 claims 1 and 4-6 were provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims of co-pending Application No. 10/886,298. Applicants respectfully traverse the rejection.

Applicants hereby repeat their response December 11, 2006—the Applicants are not the owner of Application No. 10/886,298, which is assigned to Dupont-Staley BioProducts (now DuPont Tate & Lyle BioProducts, LLC), although the applications have a common inventor. As stated in the MPEP §804(I)(1): "[I]f a "provisional" nonstatutory obviousness-type double patenting (ODP) rejection is the only rejection remaining in the earlier-filed of the two pending applications, while the later-filed application is rejectable on other grounds, the examiner should withdraw that rejection and permit the earlier-filed application to issue as a patent without a terminal disclaimer. If the "provisional" ODP rejections in two applications are the only rejections remaining in those applications, the examiner should withdraw the ODP rejection in the earlier-filed application thereby permitting that application to issue without need of a terminal disclaimer."

The present application was filed on February 13, 2002, while Application No. 10/886,298 was filed on July 6, 2004 and claimed priority from Provisional Application No. 60/485,441 filed July 7, 2003. The present application is, therefore, the earlier-filed of the two pending applications, including the provisional application from which Application No. 10/886,298 claims priority. As shown above, the remaining rejections under 35 USC §§ 102 and 103 have been obviated and no longer apply, therefore, Applicants allege that the only remaining rejection is the double patenting rejection. As such, as stated in the MPEP, that rejection must now be withdrawn since the present application is the earlier-filed of the two patent applications."

In light of all the above, Applicants respectfully request allowance of the remaining pending claims 1 and 4-6.

Respectfully submitted,

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